

THUNDERBIRD OIL CORP.

IBLA 84-455

Decided March 31, 1986

Appeal from a decision of the New Mexico State Office, Bureau of Land Management, rejecting simultaneous oil and gas lease offer NM 57533.

Affirmed.

1. Oil and Gas Leases: Applications: Generally--Oil and Gas Leases: Known Geologic Structure--Oil and Gas Leases: Noncompetitive Leases

An applicant for a noncompetitive oil and gas lease who challenges a determination that certain lands are within the known geologic structure of a producing oil or gas field has the burden of establishing that the determination is in error. The determination will not be disturbed in the absence of a showing of error by a preponderance of evidence.

2. Administrative Authority: Generally--Regulations: Force and Effect as Law

A Bureau of Land Management instruction memorandum is merely a document for internal use by BLM employees. Such documents are not regulations and have no legal force or effect.

APPEARANCES: Douglas L. Lunsford, Esq., Gregory J. Nibert, Esq., for appellant; Victor S. Lopez, Esq., Assistant Attorney General, for the State of New Mexico.

OPINION BY ADMINISTRATIVE JUDGE BURSKI

Thunderbird Oil Corporation has appealed from a decision dated March 22, 1984, by the New Mexico State Office, Bureau of Land Management (BLM), rejecting simultaneously filed oil and gas lease offer NM 57533 on the ground that the land embraced by the offer had been determined to be within an extension of an undefined known geologic structure (KGS) of a producing

oil or gas field and was, therefore, only subject to leasing through competitive bidding under 30 U.S.C. § 226(b) (1982). ^{1/}

Appellant timely filed an appeal. No answer was filed by BLM but on September 24, 1984, the Assistant Attorney General for the State of New Mexico (State) filed a petition to intervene. By order dated November 15, 1984, the Board granted the motion in part, affording the State amicus curiae status in the appeal.

The lands included in appellant's lease offer are described as Lot 4, SE 1/4 NW 1/4, E 1/2 SW 1/4, SE 1/4, sec. 7; SW 1/4 SE 1/4, sec. 13, T. 22 S., R. 32 E., New Mexico Principal Meridian, Lea County, New Mexico. BLM's action including these lands within an undefined KGS is summarized in an "Attached Sheet" of a November 29, 1983, memorandum from the District Manager, Roswell, to the New Mexico State Director.

This document noted that the additions to the undefined KGS were the result of a geological study of Tps. 21-22 S., Rs. 31-33 E., New Mexico Principal Meridian. For these studies, 19 wells in the area were reviewed. BLM was able to obtain electric logs for 17 of these wells and these were used for correlations. The report noted that:

The correlative interval used is the interval 14,478'-14,597' of the #1 Federal Well [located in the SE 1/4 NW 1/4 sec. 26, T. 21 S., R. 31 E.]. This well is producing from the Morrow interval 14,556'-14,596' which is included within the correlative interval. The correlative interval consists of interbedded limestones, shales and porous sandstones.

From the correlations made an isopach map was compiled. The map reflects production from one or more of the porous sandstones with a minimum thickness of 119'. Therefore the area within the 119' contour can be presumed to be productive.

The report recognized that certain wells within the 119-foot contour had not been productive within the correlative interval (14,478' to 14,597'). Thus, the #1 Federal "17" well, located in the NW 1/4 SE 1/4 sec. 17, T. 22 S., R. 32 E., had been plugged and abandoned. The #1 SST State well, located in the NW 1/4 SE 1/4 sec. 7, T. 22 S., R. 33 E., produced from the Morrow formation but not from the correlative interval. These were the two wells for which the electric logs were not available. BLM noted, however, that the productive depths seemed to correlate to the productive interval used in its study.

Two wells (the #1 Getty Federal "24" and the #1 Covington "A" Federal wells) produced from the Atoka, and two more (#1 Bilbrey "5" Federal and the

^{1/} KGS is defined as "technically the trap in which an accumulation of oil or gas has been discovered by drilling and determined to be productive, the limits of which include all acreage that is presumptively productive." 43 CFR 3100.0-5(b).

#2 Longhorn Unit wells) produced from the Bone Springs. There was no production from these wells in the Morrow. BLM argued, however, that these wells either showed porosity or gas in the correlative interval.

With its statement of reasons appellant submitted the report of professional geologist William J. LeMay. The report is entitled "Geological Appraisal of the Producing Limits of Atoka and Morrow Gas Pays in the Bilbrey Area Lea and Eddy County, New Mexico." Because only 40 acres of appellant's offer involved land in sec. 13, the report focused primarily on sec. 7, T. 22 S., R. 32 E. ^{2/} The LeMay analysis relied primarily on two wells, i.e., the #2 "SCL" Federal well drilled by Pogo Producing Company, located in the SE 1/4 NE 1/4 sec. 12, T. 22 S., R. 31 E., and the #1 Federal "CK" Com. well drilled by Amoco Production Company in the SE 1/4 NE 1/4 sec. 6, T. 22 S., R. 32 E. These wells were chosen because they were the most proximate of those analyzed by BLM to the land sought in sec. 7 by appellant.

LeMay noted that, while the #1 Federal "CK" Com. well was completed in the Morrow, initial production, which commenced in May 1982, averaged 13,000 MCFG for 3 months. LeMay argued, however, that from that point on, a significant decline in production had occurred, with the well producing only 4,148 MCFG in December 1983. Further, LeMay argued that data obtained from the Neutron-Density Log also indicated it was likely that the "CK" well would not be commercial, though he did recognize that it was marginally productive.

With reference to the "SCL" well drilled by Pogo, LeMay noted that while Pogo had originally attempted a completion in the Morrow, the flow rate of 340 MCFG obtained was noncommercial. Pogo then perforated the Atoka and obtained an absolute open flow rate of 1,336 MCFGPD. LeMay noted that there was no record of gas production from this well.

LeMay argued that "[t]he Atoka and Morrow interval in this area consists of a series of discontinuous, thin, tight sandstones, some of which carry gas but appear to be non-commercial based on the results of these two very expensive deep tests" (LeMay Appraisal at 2). Further, based on a cross-section, LeMay concluded that the productive sands in the Morrow found in the "CK" well were not present in the "SCL" well nor was the completed Atoka interval found in the "SCL" well observed in the "CK" well. The significance of this finding, according to LeMay was that it showed it was unlikely that the specific producing gas intervals in the "CK" and "SCL" wells extended to sec. 7, because they did not extend to each other. Generally, LeMay criticized the KGS expansion which resulted as a result of the Government action:

A multiple township assumption of productivity, based upon a 119' Isopach Contour, is not a valid geologic concept when applied to Atoka - Morrow stratigraphic traps. Because of rapid

^{2/} By limiting the thrust of its arguments to the land sought in sec. 7, appellant has essentially conceded that the 40 acres located in sec. 13, were properly KGS'd. Therefore, BLM's decision as it concerns this acreage, must be affirmed quite independently of any of the substantive arguments considered infra as they relate to sec. 7.

facies changes, each area must be analyzed as to reservoir extent, individual sand pinchouts, gas effect on the Neutron-Density Logs and individual production characteristics of producing wells.

Id. at 3. LeMay's conclusion was that:

I believe the assumption of gas productivity, which was the basis of the BLM decision rejecting the offer to lease, is in error. Although it cannot be stated with certainty that the acreage in Section 7 will not produce, the strong preponderance of evidence shows that the acreage in section 7 would not be underlain by Atoka and Morrow gas sands which have shown to be productive in the Pogo Producing Co., No. 2 "SCL" Federal and the Amoco Production Co. No. 1 Federal "CK" Com. * *

* The available data suggests that both wells encountered marginally productive gas sands in the Atoka and Morrow intervals which do not extend into Section 7.

Id. at 1.

Based on this appraisal, appellant contended that there is no continuous entrapping structure under the lands embraced by its lease offer, and that the data from the #2 "SCL" Federal and #1 Federal "CK" wells indicate that the limits of each entrapping structure do not extend to the lands in question. According to appellant, BLM erred in determining that the entire area could be presumed productive based on these two wells. Appellant further argued it had shown that BLM's KGS determination was in error. In the alternative, appellant argued that there existed sufficient factual dispute to warrant an evidentiary hearing on the propriety of the KGS determination.

Appellant also argued that current Departmental regulations and KGS determination procedures do not comport with the Mineral Leasing Act of 1920, as amended, 30 U.S.C. § 226(b) (1982). Appellant cited Instruction Memorandum (IM) No. 84-35 (Oct. 14, 1983), in which the Director, BLM, outlined procedures for delineating areas to be included in KGS's. Appellant contended that the instructions are overly-broad and suggested they were applied to its prejudice in the instant case. Elaborating, appellant explained that the net effect of factors such as structure, stratigraphic trap, porosity, permeability, water, and gas pressure must be considered in a proper KGS determination. Appellant noted that current procedures do not take these factors into account. Specifically, Thunderbird argued that in the November 29, 1984, KGS determination, BLM considered only one variable -- the thickness of sandstone -- and ignored the rest.

In response to the LeMay appraisal, the State of New Mexico submitted a Geological Supplementary Report prepared for BLM by geologist John S. Simitz. The Simitz Report sharply disputed the conclusions in the LeMay appraisal.

Thus, Simitz agreed that the Morrow gas sand fields are stratigraphic accumulations with structure playing no part in the entrapment of gas. He argued, however, that the trapping mechanism which justified extension of the KGS over the subject acreage was shale, which he noted was continuous not only in all of the wells used in appellant's cross-section but was present in all

the wells used for the isopachous map (Simitz Report at 2). Moreover, he contended that the correlations made for compiling the isopachous map clearly showed the overlapping nature of the gas sand reservoirs in the Morrow interval.

Simitz also took issue with LeMay's implicit assumption that the lack of sustained production from either the "CK" or "SCL" wells prevented extension of the KGS to sec. 7 by noting that once production from a well on a structure was obtained and an original KGS established, further extensions on the KGS were not dependent upon additional producing wells, but could be justified on the basis of drillstem tests or any other evidence which would establish that the structure extended beneath other land.

In addition to submitting the BLM supplemental analysis, the State submitted a geological statement from Paul F. Kautz, a geologist employed by the New Mexico Energy and Minerals Department. Kautz disagreed with the LeMay appraisal noting that his interpretation of the data was that "the acreage in section 7 is underlain by a stratigraphic entrapping mechanism consisting of multiple, overlapping producing sands, at least two of which are continuous between the Amoco Fed. CK #1 well in sec. 6, to the north, the Pogo Fed. "SCL" #2 in sec. 12, to the west, and wells in secs. 17 and 20 southward" (Kautz Statement at 2). While he recognized the sands were highly variable in their permeability and porosity, the two sands on which he focused (which he labeled A-4 and A-7), showed gas effect on the neutron formation density logs for the sections surrounding the land in question.

Moreover, Kautz took exception to the LeMay statement that the "CK" well in sec. 6 had been unable to sustain production from the Morrow. He suggested that the apparent decline in production noted from May 1982 to December 1983 was the result of a reduced number of operating days during that period. Thus, Kautz noted that during August and September 1984, the "CK" well averaged 8000 MCFG per month. Id. at 3.

Kautz also pointed out that two wells drilled by Grace Petroleum on locations southeast of sec. 7 (the Fed. 17 #1 in sec. 17 and the Fed. #1 in sec. 20), showed significant production from the Morrow. The Fed. 17 #1 was plugged in 1979 after producing a total of 204,185 MCFG while the Fed. #1 had produced, as of December 1983, a total of 527,304 MCFG. Kautz suggested that this lent support to recognition of the overlapping nature of the producing sands in the Morrow. Kautz concluded that the evidence supported BLM's extension of the KGS, expressly arguing that "a multiple township assumption of productivity, based on a 119' isopach, is a solid geological concept for the Morrow formation." Id. at 4-5.

Based on these two geological analyses, the State argued that appellant had failed to show error in BLM's determination. The State specifically drew the Board's attention to the decision in Nola Grace Ptasynski, 19 IBLA 125 (1975), in which the Board had affirmed an earlier KGS determination involving the Morrow in New Mexico, recognizing that the formation was composed of multiple overlapping producing intervals and was not one continuous reservoir.

Appellant responded to the State's submissions with a supplemental report prepared by LeMay (LeMay Appraisal II). LeMay noted that while he had

considered all of the data from 23 wells in the general vicinity of sec. 7, he had, indeed, focused primarily on the two wells most proximate to sec. 7 (the "CK" and "SCL" wells). He argued that, given the erratic nature of reservoir development in the Morrow formation, placing primary reliance on the nearest wells represented a prudent and acceptable geologic evaluation procedure.

With reference to specific elements of the Simitz and Kautz analyses, LeMay noted his disagreement. Thus, he totally discounted Simitz' argument that the shale was the trapping mechanism in the reservoir:

The shale referred to cannot be a trapping mechanism because it does not form a seal to any accumulation of hydrocarbons in porous and permeable reservoir rock below it. It could be a source rock for hydrocarbon generation but could not contribute to trapping the hydrocarbons in this relatively non porous and non permeable sequence of alternating sandstones, shales and limestones.

(LeMay Appraisal II at 1-2).

Noting that Kautz had asserted that at least two sands established continuity between the "CK" and "SCL" wells, LeMay argued that even if it could be established that the sands were continuous, this mere fact would not establish that the porosity and permeability within the sands were also continuous. He also argued that Kautz' assertion that the Morrow consisted of overlapping producing sands was premised on the assumption that a showing of gas effect in a well established the existence of productive sands. This, he maintained, was simply not true. Id. at 2-3.

With respect to Kautz' claim that the decline in production from the "CK" well was a function of the limited number of days which the well was produced, LeMay suggested that, contrary to the State's implicit argument, total production from the well would not result in recovery of drilling costs. Thus, LeMay submitted a correlation of declining bottom hole pressure with cumulative production (a P/Z plot) which showed ultimate recovery from the "CK" well would approximate only 270,000 MCFG. LeMay further asserted that this also tended to corroborate his original thesis that limited gas reservoirs are present in the area.

In an attempt to clearly delineate what he considered to be the critical point of disagreement, LeMay first quoted from Levorsen's definition for a stratigraphic trap, to wit, "a general term for traps that are chiefly the result of a lateral variation in the lithology of the reservoir rock, or a break in its continuity." See Levorsen, Geology of Petroleum (1967) at 286. He then contended that:

BLM has used lithology (sandstones) and not gas filled reservoir rock (porous and permeable gas bearing sandstones) to draw a sandstone isopachous map. They then claim that the area with over 119 feet of gross sandstone thickness comprises a trap. An area of thick sandstone deposition comprises just that, an area of thick sandstone deposition and nothing more. There are many

areas of thick sandstone deposition in the Morrow where no production exists. A presumption of productivity based upon a gross lithologic isopachous map within an interval of the Morrow formation is not an accurate and reliable geological approach for determining an assumption of productivity because:

1. Gross sandstone thickness does not address the continuity of reservoir rock which is the basis for the formulation of the stratigraphic traps.
2. Only a small percentage of the sandstone mapped ever developed into a reservoir quality rock and the preponderance of data (lithologic correlations, production histories and bottom hole pressure surveys) shows that gas filled reservoir quality rock covers very limited areas in the vicinity of section 7. Of the three closest wells to section 7, two, the Amoco CK Fed. and the Grace Federal "17" exhibit limited reservoirs and one, the Pogo #2 "SCL" is an apparent dry hole. [Citations omitted.]

(LeMay Appraisal II at 4-5).

In its reply brief, appellant stressed the points made by LeMay. Appellant reiterated its view that a proper KGS determination requires geological evidence of a continuous entrapping structure or multiple overlapping producing intervals, either stratigraphic or structural in nature, on which there is production. Based on the LeMay studies, appellant tabulates numerous errors in BLM's KGS determination, emphasizing the arguments made in its initial statement of reasons.

[1] Prior to analyzing the specific contentions of the parties, a few generalized statements as to the applicable law are in order. As one challenging a Departmental determination that land is within the KGS of a producing oil or gas field, appellant has the burden of showing that the determination is in error by a preponderance of the evidence. See Bender v. Clark, 744 F.2d 1424 (10th Cir. 1984); Irma R. Spear, 84 IBLA 92 (1984).

The traditional standard of proof required in a civil or administrative proceeding is proof by a "preponderance of the evidence." E.g., Herman & MacLean v. Huddleston, 459 U.S. 375, 387-88 (1983); Sea Island Broadcasting Corp. v. FCC, 627 F.2d 240, 243 (D.C. Cir. 1980), cert. denied, 449 U.S. 834 (1980); Collins Securities Corp. v. SEC, 562 F.2d 820, 823 (D.C. Cir. 1977).

In South-East Coal Co. v. Consolidation Coal Co., 434 F.2d 767, 778 (1970), the Sixth Circuit defined the "preponderance of the evidence" standard:

To establish the preponderance of the evidence means to prove that something is more likely so than not so; in other words, the "preponderance of the evidence" means such evidence, when considered and compared with that opposed to it, has more convincing force and produces in your minds belief that what is sought to be proved is more likely to be true than not true.

See Smith v. United States, 557 F. Supp. 42, 51 (W.D. Ark. 1982); Jones v. United States, 239 F. Supp. 474, 480 (E.D. La. 1965), aff'd, 358 F.2d 309 (5th Cir. 1966).

It is well established that this Board may rely on reports of the Secretary's technical experts. Ronald C. Agel, 87 IBLA 255 (1985); Woods Petroleum Co., 86 IBLA 46, 52 (1985); John P. Brogan, 85 IBLA 379, 383 (1985). In Champlin Petroleum Co., 86 IBLA 37, 40 (1985), we noted that "[w]hile the conclusions drawn from geological data are subject to different interpretations, the Secretary is entitled to rely upon the reasoned opinion of his technical expert in the field," citing Bruce R. Anderson, 63 IBLA 111 (1982).

The Secretary has traditionally delegated the duty for determination of the existence and extent of a KGS to his technical experts. A determination by Departmental technical experts will normally not be set aside where it is not arbitrary or capricious, and is supported by competent evidence. Woods Petroleum Co., supra at 52; Davis Oil Co., 53 IBLA 62, 67 (1981).

As we noted at the outset, a KGS is defined as "technically the trap in which an accumulation of oil and gas has been discovered by drilling and determined to be productive, the limits of which include all acreage that is presumptively productive" 43 CFR 3100.0-5(a). Thus, delineation of a KGS recognizes the existence of a continuous entrapping structure, on some part of which there is production, or of numerous related, but nevertheless independent stratigraphic as well as structural traps. A KGS designation of certain land may be made on the basis of drill stem tests, not just completed producing wells, which indicate that a reservoir which extends under such land is productive. Lloyd Chemical Sales, Inc., 82 IBLA 182 (1984).

It has occasionally been argued that since, by definition, all acreage included in a KGS is "presumptively productive," it is necessary to show that acreage is "presumptively productive" before it can be included within a KGS. This is not correct. Acreage included in a KGS is presumptively productive by the mere fact of its inclusion. In other words, when land is placed within a KGS the effect of the placement is to give rise to a presumption of productivity. Such land is presumptively productive because it has been properly included in a KGS rather than having been included because it is presumptively productive. While this may be a fine point it has a major effect on consideration of KGS appeals. Thus, BLM is not required to show that land included in a KGS is presumptively productive. Rather, it must merely establish that a producing structure exists which extends to the land in question. By establishing this fact, BLM necessarily establishes that the land is presumptively productive. An appellant challenging such a determination must either show that the producing structure does not underlie the land or affirmatively establish, as a fact, that the land involved is not productive from the structure in question.

Admittedly, where the trap is stratigraphic rather than structural, determination of the extent of a KGS is more problematic. Inasmuch as a stratigraphic trap is normally occasioned by facies changes altering porosity and permeability in the reservoir rock, the proper limit of a KGS is open to wide differences in interpretation. So it is in the instant case.

BLM argued that shale is the entrapping mechanism and is continuous throughout the area (Simitz Report at 2). The State, while not directly taking issue with this assertion, posits its own theory that the entrapping mechanism consists of multiple, overlapping producing sands (Kautz Statement at 2). Appellant attacks both theories. Thus, it argues that shale cannot be an entrapping mechanism as it does not form a seal to any accumulation of hydrocarbons (LeMay II at 1-2). Similarly, appellant criticizes the State's theory by noting that while identifiable sand sequences may be shown to exist in the "CK" and "SCL" wells and may also be assumed to underlie the land sought in sec. 7, this does not establish that the porosity and permeability necessary to work as an entrapping mechanism is continuous. Appellant attempts to establish that this is not the case by noting the limited extent of the reservoirs developed, particularly on the "CK" which, unlike the "SCL," was completed in the Morrow.

We must note that we find it difficult not to agree with appellant that shale cannot be the continuous entrapping mechanism in the Morrow. Given the stratigraphic nature of the accumulations, where lateral extent will be controlled by permeability and porosity variations in the sandstone, it is possible that shale will, at times, serve as an entrapping mechanism, but it is virtually impossible to ascertain how it can be a continuous entrapping mechanism. We are less convinced, however, insofar as appellant attacks the State's theory of multiple overlapping producing sands. Recent Departmental decisions and judicial affirmations thereof lend substantial theoretical justification to the State's approach.

Thus, in two recent decisions the Board has addressed extensions of the Giddings Field KGS over the Austin Chalk in Texas, an area containing extensive lithologic facies and thickness variations. See Angelina Holly Corp., 70 IBLA 294 (1983); Robert L. Lyon, 66 IBLA 141 (1982). In both cases, appellants criticized the KGS extension for the same reason pressed herein, namely, that BLM had failed to establish that a specific trap underlay the land sought but had simply relied on the fact that numerous successful completions had occurred in an admittedly highly fractured fault system. In both cases, a majority of the Board rejected these arguments and affirmed the KGS extension, noting that there was a reasonable probability that the land in question is underlain by a reservoir of a producing oil or gas field. An appeal was taken in the Angelina Holly case. In a decision styled Angelina Holly Corp. v. Clark, 587 F. Supp. 1152 (D.D.C. 1984), the district court affirmed the Board's determination that the subject land was properly KGS'd.

These rulings seem clearly applicable herein. Thus, it is admitted that various productive wells have been completed in the Morrow. It is not disputed that the 119' Morrow contour is present in section 7. What is contravened is whether BLM has shown a specific trapping mechanism extends to sec. 7. This, however, is essentially the same argument made in the Austin Chalk cases. To the extent that it proved unavailing therein, it must also be rejected here. Accordingly, we find that the land in sec. 7 was properly KGS'd.

[2] We turn now to appellant's arguments concerning the validity of current Departmental regulations and the procedures utilized in making KGS

determinations. As to the former, the Board has often held that duly promulgated regulations have the force and effect of law. Ahtna, Inc., 87 IBLA 283 (1985). Kuugpik Corp., 85 IBLA 366 (1985). An instruction memorandum, however, is a document for internal use by BLM employees. Such documents are not regulations and have no legal force, but to serve as a guide for actions of subordinate officials of BLM. Kaycee Bentonite Corp., 64 IBLA 183, 89 I.D. 262 (1982).

IM No. 84-35 is similar to USGS Circular 419. In United States v. Alexander (On Court Remand), 41 IBLA 1 (1979), supra, it was argued that inappropriate procedures were followed in making a KGS determination. The appellant there listed various factors as being required for evaluation by the circular. 3/ Our rationale in Alexander is applicable here:

While the evidence showed that the [Geological] Survey employees who made the KGS extension determination did not consider all of the factors indicated in the circular, we do not find that this establishes that their determination was in error. We cannot accept, appellant's contention, in effect, that their determination was not authorized or was improper because several factors mentioned in the circular were not considered. The circular is an informational statement of procedures and practices utilized by Survey in 1959 in making KGS determinations. Its value is in setting forth in a general way how the different KGS determinations are made, the reasons therefor, and procedures.

Alexander, supra at 10. Ultimately, of course, the key consideration is whether or not the KGS determination is sustainable under the applicable regulatory definition, i.e., 43 CFR 3100.0-5(a). Inasmuch as we have already answered that question in the affirmative, appellant's criticism of IM No. 84-35 is essentially res inter alios acta. 4/

Therefore, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the decision appealed from is affirmed.

James L. Burski
Administrative Judge

We concur:

John H. Kelly Gail M. Frazier
Administrative Judge

Administrative Judge

3/ The factors were the same as those listed by appellant herein, namely: structure, stratigraphic traps, porosity, permeability, and water and gas pressure.

4/ In light of our holding herein, we also deny the State's request for reconsideration of our order granting amicus curiae status in the appeal.

